

# Abstract

The lighting efficiency of Light-Emitting Diode (LED) have been progressing in recent years, since LED have the advantages of short reaction time, high reliability, long life time and high energy conversion (when under the condition of low light) that traditional light source couldn't catch up to, it has been used on lightening universally.

It can also apply to plant those countries which are located in high latitude or are with poor environment condition, to increase the production quantities to meet people's need, plant factory hit the world. By using the characteristics of LED grow light to give the proper wavelength of light to replace the nutrition that gives by sunshine can improve the growing condition and harvest, and can also decrease the loss that caused by insects pest and disease, this technology is highly emphasized in the flied of high economic plant.

The color temperature and lumen of grow light can be seen only by eyes, that is flux. For plant, color temperature and lumen are not effecting to photosynthesis, so, in this paper, we will converse the numerical that tested by spectrometer into absolute units, that is - power, by the conversion of mathematics formula and using flux to observe the influence of plant- growing to discuss the need of photon of photosynthesis in further step.

In this thesis, from the perspective of science to observe the growing of plant from trichromatic to the limitations of the composition of grow light , discuss the differences and applicable characteristics, the outcome can be referenced to the future development.